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NOTES FROM THE MEDICAL PRESS

IN CHARGE OF

ELIZABETH ROBINSON SCOVIL



THE EFFICIENCY OF RECENT VACCINATION

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[Reprinted from *American Medicine*]

WHILE it is true that the question of the protective power of vaccination is mainly determined by statistics, yet an intelligent person does not have to spend a very long time in the wards of a smallpox hospital until he is quite able to settle this question in his own mind without the aid of figures. The nurses, and even most of the patients themselves, become convinced of the protective power of vaccination long before they know anything about the figures that express the mortality rates of the vaccinated and the unvaccinated patients. The much larger proportion of deaths among the latter, the greater amount of suffering endured by them, the more tedious and critical convalescence when the acute stage is survived, and the more terrible physical deformities that follow, are facts too evident to pass unnoticed, even by an inexperienced observer. Indeed, there is a great deal of strong and convincing evidence of vaccinal efficacy brought to light in a large hospital that cannot very well be expressed in statistics. As the saying goes, "seeing is believing," and so an unvaccinated patient does not have to occupy a bed in a ward for any great length of time before he is convinced of the sin of omission and realizes that he is paying the penalty. Frequently so strong is this conviction that the patients desire to have messages sent to their relatives and friends urging them to get vaccinated. On one occasion a kind-hearted man, only a few hours before he was in the grip of death, dictated a letter to his brother imploring him with all the fervor and eloquence he could command to seek the benefits of vaccination at once.

During the recent epidemic of smallpox in Philadelphia the admissions to the hospital comprised about an equal number of vaccinated and unvaccinated patients. The latter were made up mainly of young children and adults in the prime of life; the proportion of children under ten years being quite large. The vaccinated patients were almost wholly adults who had been vaccinated in infancy or early childhood. No vaccinated child under five years was admitted, and but few, if any, under ten; excepting, of course, those that were vaccinated after infection by smallpox. In this connection I would say that a colored boy about ten years old, who was said to have been vaccinated four years previously and showed a good scar, was admitted with a single variolous vesicle. Also, I would mention that a white boy, about twelve years old, who was said to have been vaccinated five years previously and showed a good scar, was admitted with not more than two dozen variolous vesicles, which dried up and disappeared quickly. With these two exceptions I do not recall the admission of any patient who had been successfully vaccinated as recently as ten years. Such evidence

of the efficacy of recent vaccination is common in my experience, and it must be equally so, I am sure, in the experience of others who have had much to do with smallpox.

I have just said that about one-half of the patients admitted to the hospital were adults who had been vaccinated in infancy or early childhood. This shows that vaccination, especially when performed at an early period of life, cannot be depended upon to confer permanent immunity from smallpox. It is true, however, that some persons are permanently immunized by an infantile vaccination; but in the vast majority of persons the protection either diminishes or is lost entirely through lapse of time. Of course, the immunity may be renewed by revaccination. It is in this way that physicians and attendants of smallpox hospitals are safe-guarded.

The efficacy of recent vaccination was demonstrated very conclusively by Jenner in his early work. His first subject, James Phipps, was vaccinated May 14, 1796, and, when the vaccinia had fully completed its course, Jenner says: "In order to ascertain whether the boy, after feeling so slight an affection of the system from the cow-pox virus, was secure from the contagion of the smallpox, he was inoculated the first of July following with variolous matter immediately taken from a pustule. Several slight punctures and incisions were made on both his arms and the matter was carefully inserted, but no disease followed." . . . "Several months afterwards he was again inoculated with variolous matter, but no sensible effect was produced on the constitution." Furthermore, Jenner says that all of his early vaccinations were subjected to the same crucial test with like negative results. This shows how effectually he demonstrated the efficacy of his discovery before publishing it to the world. Quoting his own words: "I placed it on a rock, where I knew it would be immovable, before I invited the public to look at it."

While conducting his investigations Jenner inoculated with smallpox virus a number of persons who had been accidentally infected with cow-pox many years previously; in one instance the interval was as long as fifty-three years. None of these persons took smallpox, although some were freely exposed to the contagion, as well as subjected to the test of variolous inoculation. He selected these cases, he says, "to show that the change produced in the constitution (by cow-pox) is not affected by time." So convinced was he that such was the case that he made use in his first paper of this very positive language: "But what renders the cow-pox virus so extremely singular is that the person who has been thus affected is forever after secure from the infection of the smallpox; neither exposure to the variolous effluvia, nor the insertion of the matter into the skin, producing this distemper." But as time elapsed, thus giving Jenner greater opportunities for observation, he was forced to admit that the immunity conferred by vaccination was not invariably permanent, and so he modified somewhat his former statement, saying: "Duly and efficiently performed, it will protect the constitution from subsequent attacks of smallpox as much as that disease itself will. I never expected that it would do more, and it will not, I believe, do less." Of course, we all know that second attacks of smallpox occur sometimes; but the statistic data of a century show us what it was impossible for Jenner to know, that smallpox after vaccination is far more common than are second attacks of the disease. Fortunately, revaccination will supply this loss of protection.

The history of the introduction of vaccination into this country is interesting as showing how completely its prophylactic power withstood the same severe

test that was applied by Jenner. Waterhouse, of Boston, was the first person in this country who received vaccine virus in an active state from England, and with it he immediately vaccinated the members of his own family. About two months after his children had been successfully vaccinated he had them admitted into the smallpox hospital at Brookline for the purpose of testing their immunity. Finding they did not take the disease from exposure to the contagium, he had them inoculated with fresh matter taken from a patient. As they resisted the disease from this source also, Waterhouse, being fully convinced of the efficacy of vaccination, remarked, "One fact in such cases is worth a thousand arguments."

During the early days of vaccination a difference of opinion arose among the physicians of a certain town in the State of Vermont in regard to the advisability of adopting vaccination in lieu of smallpox inoculation, which was then generally practised. A town-meeting was called to consider the question, and it was decided to appoint a committee to investigate the protective power of this new disease. Certain experiments were deemed necessary, and with this object in view the committee assembled at the smallpox hospital. The first experiment consisted of selecting seventy-five persons among those who had been recently vaccinated and inoculating them with warm smallpox virus immediately taken from a patient suffering from that disease. The result was that not one of the number took smallpox. But strange to say the committee, as a whole, was not yet fully convinced that the protection was due to vaccination. With the object of settling the question to the satisfaction of every member of the committee it was decided that the experiment should be made of allowing a recently vaccinated infant to take its daily supply of nourishment from its mother's breast while she was suffering from smallpox. Without much difficulty a woman was found who was heroic enough to offer herself and her child for the experiment. The infant was first vaccinated, and forty-eight hours afterwards the mother was inoculated with smallpox virus. The vaccine disease progressed in the usual manner in the child, and so did the variolous disease in the mother, while nursing was allowed to continue without interruption. On the mother there were a considerable number of variolous pustules, some of which being near the nipple were kept raw by the lips of the infant while suckling. And yet we are told, "the child appeared as well throughout the whole process as if it had been nursed by a person not suffering from smallpox." After this evidence of vaccinal efficacy had been witnessed the committee asked for no further proof. I might add that I have more than once seen vaccinated infants continue free from smallpox under similar conditions.

As already stated, the efficacy of recent vaccination has been proved over and over again by the experience of every large hospital for the care of smallpox patients. In the hospitals of London, from 1876-79, there were admitted eleven thousand four hundred and twelve smallpox patients who had been vaccinated in infancy, but not a single case was known to have occurred in a person who had been successfully revaccinated. It was the rule to revaccinate all nurses and employes before entering the hospital, and the number thus employed amounted to about one thousand; of these only some half dozen took smallpox, and they, for some cause or other, had escaped revaccination. Dr. Marson, physician to the Smallpox Hospital, of London, for many years, says: "In thirty-five years I have never had a nurse or servant with smallpox; I revaccinate them when they come there." Dr. Collie, whose experience is also large, says: "During the epidemic of 1871, out of one hundred and ten smallpox

attendants at Homerton all but two were revaccinated, and these two took small-pox."

At a meeting of the German Vaccination Commission (1884) Dr. Eulenburg related "that a manufacturer in Posen had all his workmen vaccinated except one, who refused. This man alone of the one hundred and fifty took small-pox shortly afterwards and died." Many similar instances have been observed by others and might be referred to without much trouble.

My main object in presenting this paper is to call attention to some facts showing the protective power of vaccination, especially recent vaccination, that have come to my notice during the recent epidemic of smallpox in Philadelphia. I might add that these facts are not new; but it is hoped that cumulative evidence of this kind may serve a useful purpose.

It seems to me that it would be impossible to convey a better idea of the value of vaccination than to tell you that no person who had been recently successfully vaccinated was admitted to the hospital with smallpox. Since the outbreak of the disease in the city, which occurred last fall, every physician has been very busy in the work of vaccination, and as a result of their combined labor it is fair to assume that at least five hundred thousand persons have been vaccinated. If vaccination confers no protection against smallpox, is it not reasonable to suppose that some of these persons would have contracted the disease and been brought to the hospital? But no such patient can be found among the admissions, which number nearly two thousand. Fortunately, we do not have to rely upon such negative evidence, as strong as it is, to prove the efficacy of recent vaccination. Opportunities which enable us to determine its prophylactic value frequently occur in the hospital. If time permitted I could give many examples, but I shall present only a few. A child of one year who had been successfully vaccinated about ten days before admission was sent to the hospital with roseola vaccinosa, which had been diagnosed as variola. The child remained in the smallpox ward about three weeks and continued perfectly well. Another child, of nine years, with exactly the same history, returned home perfectly well after a constant exposure of over three weeks. An unvaccinated colored child, about two years old, was brought into the hospital with a sister who was suffering from smallpox. Immediately after admission vaccination was performed, and although the child was constantly exposed to the infection for three weeks he did not take the disease. Several other children and also some adults, who were sent to the hospital under erroneous diagnoses, were vaccinated for the first time after admission and were thereby rendered absolutely immune.

In every epidemic of smallpox that has occurred in Philadelphia within the past thirty years, instances have been observed of whole families being removed to the hospital because of an outbreak of the disease in these families. In such instances the unvaccinated children have suffered and often perished, while those who were vaccinated remained perfectly exempt, although living, eating, and sleeping in the infected atmosphere for several weeks. But I have yet to see a single unvaccinated child escape the disease under similar conditions of exposure. Furthermore, I have more than once seen a vaccinated infant take its daily supply of nourishment from the breast of its mother who was suffering from varioloid and the infant continue as free from smallpox as if the disease were one hundred miles away and the food derived from the most wholesome source. This is evidence of the prophylactic power of vaccination that does not appear in mortality reports nor in statistic records.

Not many weeks since, a pregnant woman nearly at term was admitted with

varioid. In the course of the disease labor occurred, and a male child weighing eight and one-half pounds was born. About five hours after its birth the infant was vaccinated, two insertions being made. Again, two days subsequently, two more insertions were made. Four large vaccine vesicles developed, causing a very sore arm, but did not give rise to any considerable elevation of temperature nor to any apparent disturbance of the health of the infant. After remaining in the hospital thirty-two days and proving its newly acquired immunity to smallpox in a most indubitable manner, the infant was taken home by its mother, who had made a good recovery without any untoward symptoms. At the request of the mother the child was fed from the bottle.

In the early fall of last year smallpox broke out in a certain family, and the entire household, including father, mother, and six children, were admitted to the hospital. The parents were vaccinated in infancy, but as the protection had become somewhat diminished through the lapse of time, they both suffered from a mild attack of varioid. Their four youngest children were unvaccinated and they all had unmodified smallpox. Two children had arrived at the school age, one four years and the other two years ago, but before they could be admitted to school vaccination was necessary. Each child showed a good scar. These children remained in the hospital three or four weeks, being in daily contact with the worst cases of smallpox, and at the end of that time returned to their home without having shown any symptoms whatever of the disease. The father, like an honest man, said, "I never believed in vaccination before, but am now convinced of its efficacy, and when I return home I shall preach it to my friends." I might add that this man is not the only anti-vaccinationist who has left the hospital fully converted. This institution would be indeed a dangerous place for the president of the Anti-Vaccination League to visit if he did not wish to lose his office.

In the early part of this year a colored child, aged three, was sent to the hospital with a few small pimples of no very definite character. Smallpox was suspected, as that disease had broken out in the family. The child had been successfully vaccinated about four months before. After constant exposure for sixteen days, immunity being clearly demonstrated, the child was allowed to go home.

About the same time three white children were brought to the hospital with their mother, who had smallpox. They were not ill, but were sent in because they had already been exposed, and also because there was no one left at home to care for them. These children were, respectively, seven, five, and four years old. Each had been vaccinated exactly three years and seven months before, and each showed a good scar. Immunity to smallpox was proved by their residing in the hospital for three weeks free from the disease.

J. B., aged twenty-nine, married, and the father of three children, was admitted March 27, with varioid. On April 5, the wife of this man was also admitted with varioid, bringing with her the three children, as there was no one left at home to care for them. One child, five years old, had been vaccinated six months previously and showed a good scar. The other two children, one three years and the other ten months, were vaccinated March 30, and each presented two vaccine vesicles that were developing perfectly. These three children remained in the hospital seventeen days under constant exposure without taking smallpox.

Similar evidence of the prophylactic power of vaccination has come to my notice repeatedly, both inside and outside the hospital. Very frequently, indeed,

have I been told by patients that their older children who had to be vaccinated before they could get into school were left at home perfectly free from smallpox, while the younger ones, being unprotected, were brought in with the disease. Oh, how often have I seen parents, after losing a loved one, grievously mourn and refuse to be comforted because of the consciousness of having neglected a most important duty! I have often wished that the ghost of these innocent and helpless children could return to haunt the anti-vaccinationists, who are largely responsible for this neglect of duty.

In order to provide accommodation for the unusually large number of cases of smallpox, and this number rapidly increasing, it was necessary to erect additional buildings as well as enlarge those already in use. On this work from fifty to sixty men were employed, and as they were required to come constantly into close proximity to the patients they were all requested to come to the administration building and get vaccinated. This request was complied with by all except two, and these two took smallpox. I would emphasize the fact that they were the only ones that were stricken by the disease. One, I understand, was a Christian Scientist, and he trusted to this delusion for his protection. Poor fellow! it did not even save his life, as he fell a ready victim to a disease that respects nothing but vaccination.

Later it was found necessary to enlarge still further some of these buildings, and other workmen were engaged. Two of these, for some reason which I never learned, neglected to get vaccinated before commencing the work, and they both took smallpox.

For the last three years the medical schools of Philadelphia have had the privilege of sending their more advanced students to the Municipal Hospital for clinical instruction in the various contagious and infectious diseases therein treated. During the past winter one hundred and seventy students received such instruction, not only in the diphtheria and scarlet-fever wards, but also in the smallpox wards when there were about three hundred cases of that disease on hand. One of the requirements was that each student must show evidence of protection, either by having been recently successfully vaccinated or by not responding to vaccination after two or three careful trials. It gives me great pleasure to state that not one of these students contracted smallpox.

Since the present epidemic began, about one hundred and twenty-five persons including physicians, nurses, ward maids, cooks, laundresses, and the like, have been continuously exposed to smallpox in the hospital, and not one has fallen with the disease. I should perhaps mention the case of an employé who worked in the disinfecting plant which is located on the grounds. It was his business to handle infected clothing and bedding. He soon became dissatisfied with this work and removed to the interior of the State. When he had been there but a few days, I am informed, he took smallpox. This man had been vaccinated in infancy, but declined to be revaccinated.

All those employed in the smallpox pavilion, except two or three who had the disease at an early period of life, owe their immunity to vaccination. Previously to assigning them to duty each person is carefully vaccinated, even though the vaccination of infancy and a subsequent revaccination may show evidence of having been successful. With this care I have never seen a resident physician or nurse take smallpox. I do not hesitate to say that after a recent successful vaccination an individual can dwell in an atmosphere surcharged with the most virulent variolous poison, and live and breathe and eat and sleep there in safety.

As the three Hebrew children of old, under proper protection, walked up and down in the fiery furnace and came forth without a single hair of their heads being singed, or even the smell of fire on their garments, so nurses and others when recently vaccinated need have no fear for that malady which might be likened to "the pestilence that walked in darkness, nor for the destruction that wasteth at noonday." Such absolute protection under conditions of extreme exposure is what has happened in every epidemic of smallpox since Jenner taught us how to control the pestilence, and is happening to-day in the wards of every well-conducted hospital. What vaccination does for these persons that dwell in the midst of danger it will do for anyone that is brought properly under its influence.



THE paper on "Women in Germany," read by Fräulein Antoine Stolle at the National Suffrage Convention in February last, is of intense interest and, though depressing in the extreme to those who believe in the equality of women, it is not discouraging, for, as Fräulein Stolle says, "however long and weary the road may seem that leads German women to economic, intellectual, and legal equality with men, they are fully determined neither to pause nor to halt until they have reached the goal of freedom." Yet when one reads over her statements of existing conditions in every degree and rank of society,—the status of domestic service, of factory work, of education, of the higher professional lines of work, and no less of domestic relations, the status of the daughter, wife, and mother,—one's heart aches for the long and weary way they still have to go.

Fräulein Stolle says, "Willingly or unwillingly, it is admitted that economic and social conditions force a continually increasing number of German women to earn their own living," and "even in tenaciously conservative circles it is recognized that women in their battle for existence can no longer be denied their only weapon—a thorough, universal, and professional education."

Thank heaven, we say, for the exigencies of work, since they can compel the opening of doors which the brilliant and learned Professor Münsterberg, whose articles on American women and their education have been so widely read, would fain keep closed. On this point of necessary self-support Professor Münsterberg has only this weak remark to make: "It is true that in Germany a million women are compelled to remain unmarried;—however, no woman, of course, wishes to be among that million."

THE visit of Prince Henry to Boston brought out the story of an old lady of great nursing renown, lately living in Boston and recently deceased. She was born in Massachusetts some eighty-odd years ago, the daughter of a physician, and worked as a surgical nurse during the four years of the Civil War at her own expense: after this she held a position as nurse in the Massachusetts General Hospital (this was, of course, before the day of training-schools). Having married a German nobleman, who died early, she was moved to offer her services to her husband's people in the Franco-Prussian War, and for her great bravery and conspicuous services during this war she received the Order of the Iron Cross from the Emperor William, a high honor, which only one other American woman, Miss Clara Barton, has ever received.